IN THE CLAIMS:

1. (Previously Presented) A microscope comprising:

two objectives between which a light-transmitting specimen is arranged;

said objectives having substantially identical optical characteristics;

at least one of said two objectives being followed by a mirror for reflecting light transmitted through the specimen back into itself exactly wherein the mirror is placed in a back focal plane (pupil plane) of said at least one objective;

a detector for receiving fluorescent radiation from the specimen;

wherein a transmitted excitation light and said fluorescent radiation are reflected by said mirror, but only said reflected fluorescent radiation along with said fluorescent radiation coming directly from the specimen are reimaged on the detector without the reflected excitation light.

2. (Cancelled)

3. (Previously Presented) The microscope according to claim 1, with incident illumination and field transmission of an image information, wherein one of the objectives serves as a microscope objective and the second objective is part of a reflecting device through which the specimen is imaged onto itself with lateral and vertical accuracy.

4. (Cancelled)

5. (Currently Amended) The microscope according to claim 1, ~~but with~~ wherein the microscope further comprises a coherent illumination source in which one of the mirrors is constructed as a phase-conjugating mirror.

6. (Cancelled)

7. (Cancelled)

8. (Previously Presented) The microscope according to claim 1, constructed as a laser scanning microscope, wherein one of the objectives serves as a microscope objective and the second objective is part of a reflecting device having a phase-conjugating mirror or an adaptive mirror by which the wavefront of the reflected light is made to coincide with the wavefront of the transmitted light.

9. (Previously Presented) The microscope according to claim 8, wherein the adaptive mirror (23) is provided with a deformable mirror surface arranged on a diaphragm, and a plurality of individual electrodes are located opposite the diaphragm on its side remote of the mirror surface , and electric voltage is applied to the diaphragm on the one hand and to the electrodes on the other hand, and the deformation of the diaphragm is brought about by changing the voltages and electrostatic forces acting between the diaphragm and electrodes.

10. (Currently Amended) The microscope according to claim 9, wherein the electrodes communicate with ~~a detection device~~ said detector for a beam component which is coupled out of an observation beam path, with fluorescent radiation proceeding from the specimen.

11. (Previously Presented) The microscope according to claim 1, wherein the reflecting device is constructed as a brightfield arrangement having two objectives which together form an optical system with an infinite output intersection length.

12. (Cancelled)

13. (Currently Amended) The microscope according to claim 1, wherein at least one of the objectives is connected with adjusting devices for displacement in axial and/or radial direction and the adjustment is carried out depending on ~~the~~ a observation beam path with respect to its intensity or contrast.

14. (Cancelled)

15. (Cancelled)

16. (Previously Presented) The microscope according to claim 1, wherein there is a detector for a beam component which is coupled out of an observation beam path, with fluorescent radiation proceeding from the specimen.

17. (Previously Presented) The microscope according to claim 8, wherein the adaptive mirror is provided with a deformable mirror surface arranged on a diaphragm, the diaphragm is connected, on its side remote of the mirror surface, to a plurality of individual piezoelectric drives and the deformation of the diaphragm is brought about by controlling the piezoelectric drives.

18. (Previously Presented) The microscope according to claim 17, wherein the piezoelectric drives communicate with a detection device for a beam component which is coupled out of the observation beam path, with fluorescent radiation proceeding from the specimen.

19. (Previously Presented) A microscope comprising:

two objectives between which a light-transmitting specimen is arranged;

said objectives having substantially identical optical characteristics; and

at least one of said two objectives being followed by a phase-conjugating mirror for reflecting light transmitted through the specimen back into itself exactly with respect to direction and phase front, wherein said phase-conjugating mirror is placed in a back focal plane (pupil plane) of said at least one objective; and

a detector for receiving fluorescent radiation from the specimen;

wherein a transmitted excitation light and said fluorescent radiation are reflected by said phase-conjugating mirror, but only said reflected fluorescent radiation along with said fluorescent radiation coming directly from the specimen are reimaged on the detector without the reflected excitation light.

20. (Previously Presented) A confocal laser scanning microscope for examining a light transmitting specimen comprising:

a laser for providing excitation light to the light transmitting specimen to induce fluorescence in the specimen whereupon the excitation light and the fluorescence is transmitted through the specimen;

two objectives between which the light-transmitting specimen is arranged;

a first pinhole diaphragm located between the laser and the objectives;

said objectives having substantially identical optical characteristics;

at least one of said two objectives being followed by an optically adaptive mirror or phase conjugating mirror for reflecting the excitation light and the fluorescence transmitted through the specimen back into the specimen exactly to improve contrast, wherein the optically adaptive mirror or phase conjugating mirror is placed in a back focal plane (pupil plane) of said at least one objective;

a detector for receiving specimen fluorescent radiation from the light transmitting specimen;

a second pinhole diaphragm located between the objectives and the detector;

wherein a transmitted excitation light and said fluorescent radiation are reflected by said optically adaptive mirror or phase conjugating mirror, but only said reflected fluorescent radiation along with said fluorescent radiation coming directly from the specimen are reimaged on the detector without the reflected excitation light.